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NOVEMBER 1962

WASHINGTON UNIVERSITY

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Magazine

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WHERE THE RIVERS MEET

*On the Inauguration of Thomas Hopkinson Eliot
as Chancellor of Washington University
October 12, 1962*

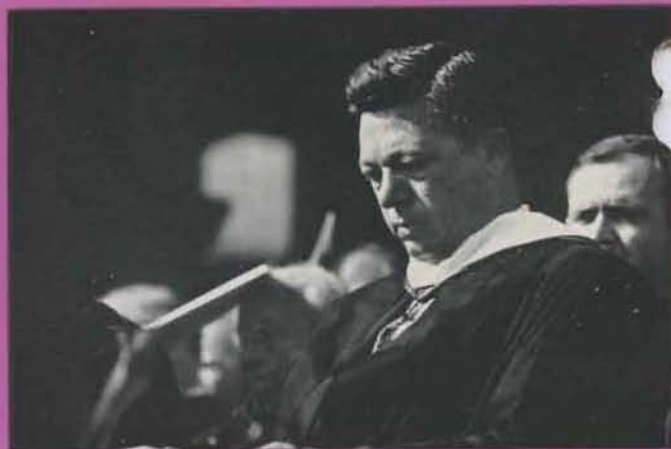
By WILLIAM JAY SMITH

HERE WHERE THE winding rivers meet,
What is it that the autumn air,
So full and fine, so bitter-sweet,
Would clearly now declare?
Queen Anne's lace and golden rod
That grace this bright Columbus day—
Unto what glory do they nod?
What have they now to say?
The regal pheasant, dove, and quail,
The cardinals and flashing jays,
Met with on an Ozark trail—
What is it now they praise?

Those rivers that no dark can dim—
The Meramec, the Gasconade—
Where summer-long I used to swim,
And other boys now wade;
That gravel bank, that clear, cold spring,
Where, shaded, pensively I sat
And fished for crawfish on a string
With strips of bacon fat;
Those lean-tos built of sassafras,
Tents pitched with wobbly sumac poles,
Those caverns reached through fern and grass
By frightening sinkholes,—

Remembered places that I see,
Persimmons ripened on a bough,
But riper now in memory—
What have they to avow?
St. Louis, birthplace of the blues,
Of T. S. Eliot, Eugene Field,
Producer of good beer and shoes,
Of Prophets unrevealed,
St. Louis, you whose every haunt
I used to know—your parks, your drives,
The shanties on your riverfront,
Your mansions and your dives,—

City, whose spirit once possessed
Charles Lindbergh the moment he
Brought his rickety plane to rest,—
What would you have us see?
City, whose every thoroughfare—
Broadway and Olive, Delmar, Grand—
Leads to that central fountain, where,
A flower in his hand,
Mississippi strides to meet
Missouri, nude in open court,
While wind-blown fans of spray compete,
And water-folk cavort,—



William Jay Smith, AB 39, MA 41, poet-in-residence at Williams College, reads his poem at the Inauguration.

Streets that are named for Lafayette,
Pierre Laclède, Auguste Chouteau,
What would you have us not forget,
What would you let us know?
Streets that I travelled early, late,
And now but faintly recognize,
What is it that they celebrate,
What do they emphasize?
Remembered streets and fields and flowers,
The rich, rewarding out-of-doors,—
All announce this day is ours,
This day, our Chancellor's.

And those who have assembled here
To wish him health, long life, and fame,
The red and green of autumn wear,
To glorify his name;
So may this day of fine converse
In festive hood and somber robe
Be the pivot of their universe,
The center of their globe;
May winter snow and autumn rain
Be all clear weather on their chart;
Reward them with a fertile brain
And understanding heart.

May they probe wisdom's deepest worth,
The flood of learning never stem,
That they may honor him henceforth
Who this day honors them.
May every mind and heart explore
The space expanding with the stars
That illuminate this muddy shore,
These willow-banked sandbars;
And may they brighten all his days
Until each eye enlightened greet
The Chancellor, whom now we praise
Here where the rivers meet.

WASHINGTON UNIVERSITY *Magazine*

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NOVEMBER 1962

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ON OCTOBER 12, 1962, Washington University installed the twelfth chancellor in its history. It was a formal and dignified occasion, and, yet, a happy one. Held in Brookings Quadrangle on a bright, sunny day, the convocation ceremony drew a crowd of several thousand. Climax of the ceremony was the official installation of Thomas Hopkinson Eliot in office. This historic moment was preceded by the presentation of greetings to the new chancellor by the distinguished guests and was followed by the Chancellor's Inaugural Address and the awarding of honorary degrees. After the convocation, luncheon was served on the lawn, open house was held at the new John M. Olin Library and at the Forsyth Residence Halls, and a chamber music program was presented in Graham Chapel. By nightfall, the ceremonies had blended gracefully into the homecoming celebration, climaxed by a Bear football victory the next afternoon and the Inaugural-Homecoming Ball the following night.



On Inauguration Day, Chancellor Eliot returns to the Chancellor's Residence from an early morning walk—complete with pipe and dog.



University grounds crews prepare for the big occasion, setting up the stage and putting up thousands of chairs in the Quadrangle.



Participants in the ceremony don their academic robes in the new Olin Library in preparation for the procession to the stage.



INAUGURATION

*Thomas H. Eliot is officially installed
as the University's twelfth chancellor*



Grand Marshal William G. Bowling leads the academic procession along the ginkgo-lined path from Olin Library to the Quadrangle.

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The Washington University Chorus and Brass, under the direction of Orland Johnson, performed during Convocation.



Chancellor Eliot and former chancellor Ethan A. H. Shepley arrive at the stage. As chairman of the University's board of directors, Mr. Shepley presided over the Inaugural ceremonies.



Merle Fainsod, AB 28, AM 30, LLD 56, brings greetings to the chancellor from Harvard University, Mr. Eliot's Alma Mater. Dr. Fainsod is professor of government and director of the Russian Research Center at Harvard University.



Greetings from the American Council on Education are presented by Logan Wilson, president of the Council and former president and chancellor of the University of Texas.



Mrs. Mary Ingraham Bunting, president of Radcliffe College and former dean of Douglass College, brought greetings to the chancellor from the women's colleges of the nation.



Paul Freund, AB 28, LLD 56, professor of law at Harvard University, represented Harvard at the Inauguration ceremonies.



After being formally installed in office, Chancellor Eliot wears the official badge of his office. At his right are two former chancellors, Ethan A. H. Shepley and Carl Tolman.

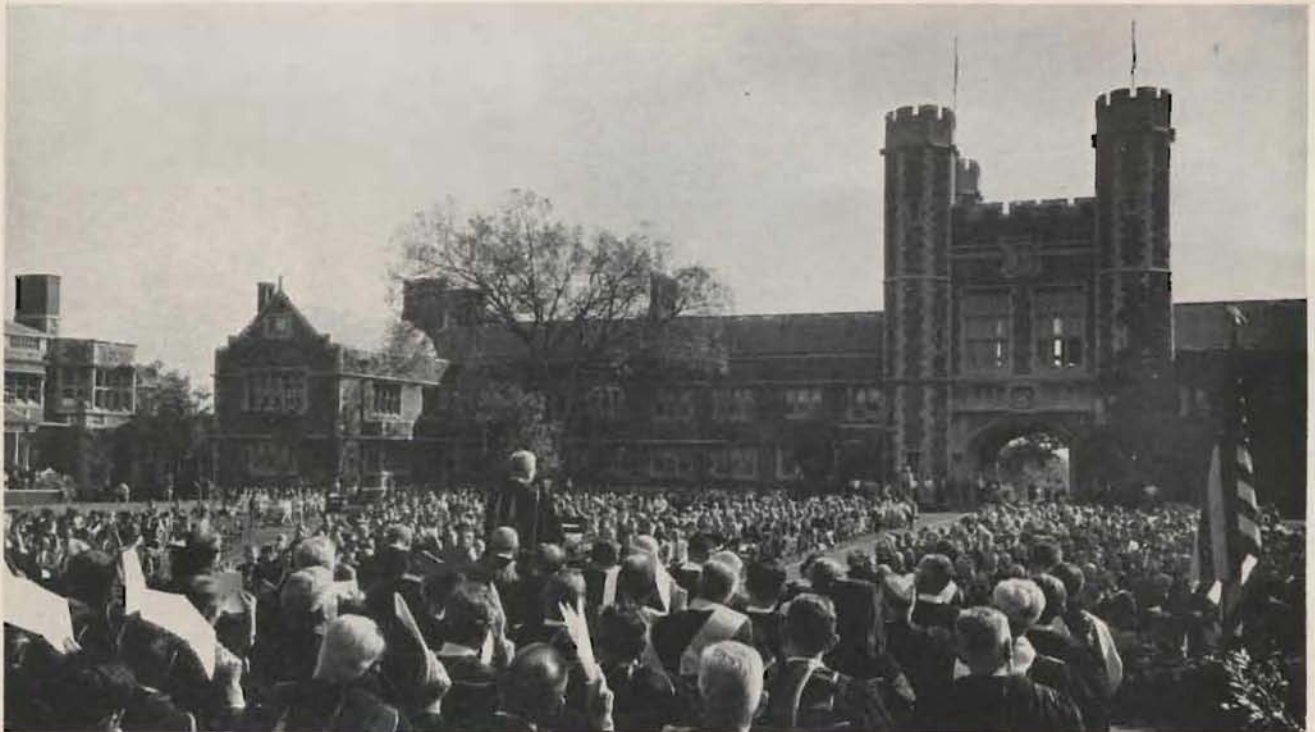


Chancellor Eliot confers the honorary degree of Doctor of Laws upon Mary Ingraham Bunting. Edward W. Dempsey, dean of the School of Medicine, presented President Bunting to the chancellor.

INAUGURATION



Logan Wilson was also awarded an honorary Doctor of Laws degree from the University. He was presented for the honor by George E. Pake, provost of the University.





Official greetings to Chancellor Eliot from other colleges and universities throughout the world were displayed at the John M. Olin Library on Inauguration day.



Two of the distinguished guests, both alumni of Washington University, meet before the ceremonies: Dr. Fainsod and William Jay Smith.



After the Inaugural luncheon, an open house was held at the newly completed John M. Olin Library. Inauguration guests toured the library and also visited the Forsyth Residence Halls.

INAUGURATION



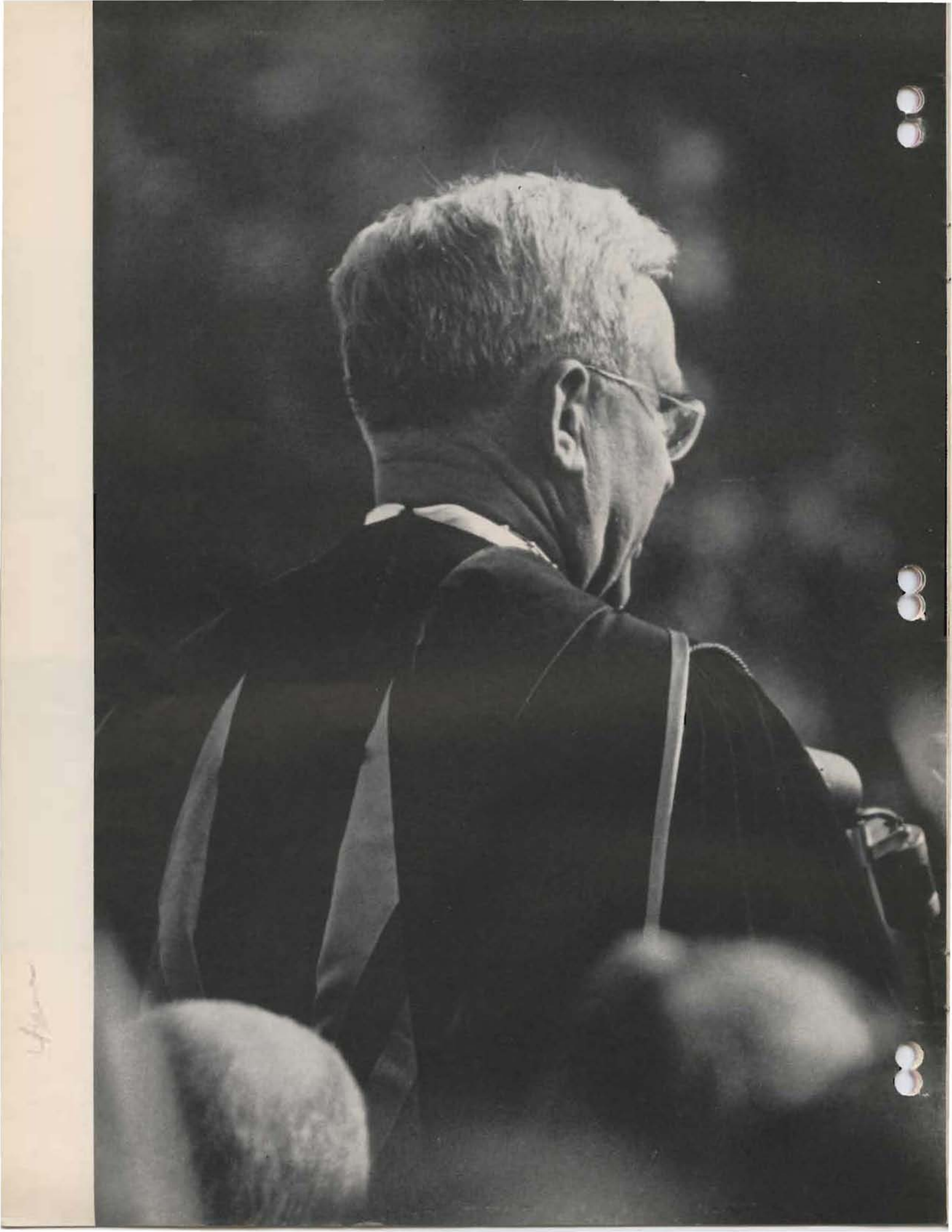
Washington University's Battling Bears made the Inauguration-Homecoming weekend complete by defeating the Valparaiso Crusaders 20-14. Among the 8000 spectators was a most enthusiastic chancellor.



One of the pleasant duties of a chancellor is dancing with campus queens. Here the newly installed chancellor waltzes with the newly crowned Homecoming Queen, Ann Boyer, a junior in the School of Architecture.



At the Chancellor's Inaugural-Homecoming Ball, Chancellor and Mrs. Eliot chat with the finalists in the Homecoming Queen competition.



*On the occasion of his formal installation
in office, Chancellor Eliot outlines the
University's goals for the coming year and
emphasizes the University's responsibilities*

INAUGURAL ADDRESS

By THOMAS H. ELIOT

Chancellor, Washington University

I ACCEPT THE HIGH HONOR that has been conferred upon me. With it, I accept the responsibility of the position of chancellor. It is a great responsibility, but happily it is a shared one. For the head of any good university has little if any exclusive power. He is just one of the many people who, all together, make the institution what it is.

Of course, his position may seem to give him preponderant influence; but even this, perhaps, is a delusion. For example, last February there was a fine student celebration of Washington's birthday, with due protest being made of the fact that that day was not a holiday on this campus. On that occasion, as vice chancellor, I evoked cheers by telling the students that I thought it should be a holiday. Soon thereafter, I became chancellor. What happened? I told the calendar committee, composed of distinguished faculty members and administrators, that it was most inappropriate to have George Washington's birthday celebrated as a holiday everywhere except at a university named for George Washington. The committee members all nodded their heads, and deliberated at great length, and finally reported that the exigencies of the academic calendar for 1963 made the suspension of classes on February 22 quite impossible. So much for the chancellor's influence—except that thanks to a different committee, we are upsetting the calendar by having an unscheduled academic holiday, not on Washington's birthday to be sure, but on Columbus Day instead!

Seriously, I recognize, of course, the impact that a chancellor can make on a university. I could not have

served here during the last year of Arthur Compton's incumbency and throughout Ethan Shepley's, without being aware of that. For theirs were regimes during which Washington University began to be transformed. Without the vision and leadership of these men, the transformation—still incomplete—might never have been begun. But it was begun. And it is to the lasting credit of Carl Tolman that the momentum of the nineteen-fifties was not lost during his year as chancellor.

The visible evidence of transformation is all around us. Yet in one sense there is nothing new here. We still pursue the goal set by the founders over a century ago—the goal of being a serviceable institution capable of deepening the knowledge and enlarging the lives of an educated citizenry. This continuity is well represented by the alumni here today, including two of the visitors who spoke such generous words this morning.

Change now, as in the time of Robert Brookings, is largely adaptation to changing circumstances. It may and should be also a response to new opportunities. Our distinguished guests from the banks of the Potomac and the Charles exemplify the broadening of opportunities for service since the days of William Greenleaf Eliot and, indeed, of Mr. Brookings—the intrusion, into college halls formerly local and predominantly masculine, of the national interest through one door and a host of young women through another.

To seize "opportunities for service" is to accept respon-

sibility. That is what I want to dwell on today—the responsibility of this university.

First, we have the duty of providing promising students with a good education. This requires, among other things, classes of moderate size, the supervision of individual programs, and frequent personal and often informal contact between student and teacher. We will grow, but we will not seek very greatly to increase our numbers. Let us continue to stress quality rather than quantity.

Our curricular requirements must be attuned to the modern age. Obsolete walls that divide the traditional disciplines must not also block our students' entrance into the nineteen-sixties. Not all of the definitions of undergraduate "majors" and graduate degrees that made sense for the 'twenties and 'thirties necessarily make sense for the 'sixties and 'seventies. Certainly they do not do so if they prevent a student's acquisition of a deep, thorough knowledge of some nation or area of the world besides our own. Hopeful indeed, therefore, is the growing recognition of "regional studies" as a legitimate curricular concept—studies that properly embrace social sciences and art, philosophy and history, language and literature. We should encourage the further development of such programs here.

In the sciences, likewise, relationships are becoming more important than dividing lines. Will a trained biologist break new ground in the future, if he lacks a basic knowledge of quantum chemistry? Can the engineer make a major contribution ten or twenty years hence, without an understanding of the physics of solids? It is a good thing that the faculty, in the last year, has raised such questions as these, by causing the establishment of a Planning Council for Biology and a new curriculum in the School of Engineering.

Other needless barriers need to be lowered. I refer to organizational barriers that separate not only our departments but our various schools and divisions. The more a university makes of the opportunities which its diversity provides, the better it will meet its responsibilities to its students. Structural rigidity should not be allowed to prevent our students in all divisions from having the opportunity, for example, to study the history of medicine or biological ideas, or the impact of law on society. Every student and every teacher in any one of our schools here is a student or teacher not just of that school, but of Washington University. Let us never forget this.

As we aspire to closer working relationships among our professional schools and the rest of the university, let us not lose sight of the fact that the most fruitful professional training follows a liberal college education. The doctor or lawyer or engineer or architect or social worker is better equipped to practice his profession, participate intelligently as a citizen, and make the most of his life, if he is an educated man. It is the responsibility of this university to help him to become one.

Historically, Washington University has grown by the sporadic establishment or acquisition of specialized schools, some clearly professional and others originally vocational schools and still classified as "undergraduate." Some of the latter have in the past produced distinguished leaders.

The demands of today and tomorrow, however, require a professional school to adhere to standards which can ordinarily be met only by those whose education has already extended well beyond high school. I look forward, therefore, to the day when our professional schools are all graduate schools. In several instances, this means a change of the kind successfully exemplified within the last decade by our School of Social Work. It means, too, that all our undergraduates would partake of a broad liberal arts program.

The adoption of such a policy will create one difficult problem. The increasing complexity of subject matter—the expansion of knowledge—requires in many fields more time for specialized study than has been typical in the past. There is just more to learn. Therefore, even while we insist that our students should not skip or slight the liberal arts, we must devise ways of speeding up their entrance into the special fields of their choice. We must foster opportunities for early specialization—as we have modestly begun to do, for example, by the recognition of architecture as a "major" in the College of Liberal Arts. This will not be a simple task. It will demand of us ingenuity, imagination, and innovation.

Change—organizational, curricular, what you will—is not easy to achieve. But only a dynamic university can meet its responsibility in a swiftly changing world.

A university's obligations do, however, remain in some respects unchanging.

For its students it must always provide an education that leads toward wisdom and the use of wisdom. This is a worldly, practical goal: it was Holmes, I think, who reminded us that what the world pays for is judgment. It is also a moral objective: as a good neighbor of ours has recently said, "To be morally responsible is to set one's self in proper perspective within the world of space and time, and to respond by personal involvement in the world's work. One's schooling is his formal preparation for the assumption of this moral responsibility."^{*}

For students and faculty alike, in this university, always (to quote a forebear of mine) "the winnowing breeze of freedom must blow through all its chambers"—for "an atmosphere of intellectual freedom is the native air of literature and science."^{**}

I have been speaking of the university's obligation to its students and its faculty. This means, essentially, its obligation to itself. A responsible university is one where mutual obligations are perceived and fulfilled. This depends on mutual respect and recognition—of one discipline for the value of another; of teachers and students for one another; of the scholar for the service of the non-academic staff, and of the staff for the high calling of the scholar; of those on the campus for the work of a devoted board of directors, and of the board for those on the campus; of all, for the generous support, the unstinting effort, the solid achievements that have given Washington University distinction in the world of higher education.

^{*} Merrimon Cuninggim, "Education for Moral Responsibility" (*Junior College Journal*, May, 1962).

^{**} Charles W. Eliot: Inaugural Address, Harvard University, October 19, 1869.

Let me turn now to our responsibilities to our community, our country, and our world.

A truly distinguished university is an asset to its community. It enriches the artistic, musical, and intellectual life of the metropolis. It provides opportunities for sound, formal education "after hours," for those not necessarily seeking academic degrees. Its scientists, engineers, and social scientists contribute to the improvement of industry and government, and to the solution of social problems. Its medical school is the heart of a renowned complex of hospitals and clinics. A university can be true to itself—can play its proper part of imparting knowledge and finding or creating new knowledge—without encasing itself behind a wall studded with ivory towers. The prime significance within a university of so-called "pure research"—the discovery of new knowledge—does not prevent its scholars from serving the community through the application of their findings. For over a century the history and development of Washington University has been intertwined with the growth of metropolitan St. Louis. This relationship will continue—in, I trust, an atmosphere of ever-increasing mutual respect, good will, and support.

When I speak of the larger area to which our obligations run, there is a special challenge which I think it is our institutional responsibility to try to meet—the need to prepare more and better college teachers. This need arises from the rapid increase in population and the even swifter increase in the proportion of boys and girls who go to college.

To meet these increases, new institutions are springing up everywhere. Supposedly, they are institutions of higher education. But they cannot really be much "higher" than the high school if they do not have good college teachers. The supply of good college teachers will utterly fail to meet the demand, if we don't do something about it, fast. In many places, a college education will be a waste of time and money and the bachelor's degree will become merely a time-server's badge.

Let us at Washington University shoulder our share of the responsibility for preventing any such sorry downgrading of college education in America. Let us accept as one of our major goals the development of college teachers. All universities do a little of this, now, but nowhere near enough. It is not so much a matter of mere numbers—though I hope the number of our graduate students in the arts and sciences will continue to grow—as it is of recruiting and preparation. The doctorate is a passport to the college classroom—but is it always a valid passport? We all know that, too often, it is not. We should foster a program which begins before the bachelor's degree is granted, is distinguished by a rigorous process of selection, and includes substantial experience in supervised teaching at the college level. Given financial support, we can do this without detriment to our own undergraduate instruction—as many of you know, I have long been an advocate of bringing freshmen directly into contact with our most distinguished professors—and without reducing the number or quality of research scholars who earn the doctorate here.

Let me sum up. We can best do our duty if, in addition to what we are now doing—

We give to all undergraduates a liberal education;

We devise methods of accelerating the undergraduate's entry into specialized study, despite the imaginary boundaries that separate one school from another;

We emphasize area studies, directed by experts in appropriate disciplines but unhampered by obsolete curricular barriers;

We seek always to increase the quality of our service to the community of which we are a part;

We concentrate consciously and imaginatively on the rigorous preparation of young men and women for college teaching;

We make more pervasive on this campus the atmosphere already noticeable here, of teachers and students informally discovering together the excitement and joy of cultural growth and intellectual adventure.

These are some of the things that we can and should do. Our lasting service to the nation will be assessed, however, in more general terms. Achievement, evidenced by the creative research of its scholars and the quality of its graduates, is the ultimate measure of a university's greatness. We meet our broadest obligation when new discoveries of truth are made in our libraries and laboratories and when young men and women leave Washington University armed with a zest for learning, a growing capacity for judgment, and the ability and determination to serve their fellow men.

We build for the future even when reason reminds us that the future of mankind could be an early day of "incandescent terror." Our minds know that the chance of the survival of the race and its institutions can be fostered by human effort; and our hearts tell us that we must seek the wisdom to sustain that effort, with persistence and with courage.

It is appropriate, on this Columbus Day, that I quote a great philosopher's lines:

Columbus found a world, and had no chart,
Save one that faith deciphered in the skies;
To trust the soul's invincible surmise
Was all his science and his only art.
Our knowledge is a torch of smoky pine
That lights the pathway but one step ahead
Across a void of mystery and dread.
Bid, then, the tender light of faith to shine
By which alone the mortal heart is led
Unto the thinking of the thought divine.

Let the logic of our minds be illuminated by the meditations of our hearts. Let institutions, such as Washington University, that we serve and love, play a gallant part in the great work of helping humanity—not only to survive but to be worthy of survival, through the cultivation of the mind and the ennobling of the human spirit.





Chancellor Thomas H. Eliot receives a standing ovation after addressing a session of the American Freedom Institute.



In an unusual summer session on the Washington University campus, high school students learn about basic American values

FREEDOM INSTITUTE

SEVENTY-FIVE HIGH SCHOOL JUNIORS from 20 states spent five weeks this past summer on the Washington University campus in a concentrated study of our American freedoms. Being a bright, articulate, imaginative group of young people, they not only gained a great deal from this unusual experience, but had a whale of a good time in the process.

Behind the University's decision to hold this first American Freedom Summer Institute was a feeling, shared by educators across the nation, that schools and colleges need to do a much better job of educating their students to the positive side of our American system and of what our nation stands for: not for fear of the extreme right or left, but to build a better informed citizenry, confident in the value of a democratic society. Financial support for the venture came from the Danforth Foundation, through the Educational Council for Responsible Citizenship.

The Institute's subject matter might have seemed heavy going for any but a highly intelligent group of teenagers—which these decidedly were. Under study were concepts of legal justice, civil rights, liberties, political and economic systems, the American national purpose, and the contrast between American and non-Western systems, both in the present and in their historical development.

Institute students attended two daily hour-and-a-half lectures and discussion seminars and were assigned ten books and more than 200 pages of mimeographed material to read. The schedule also included field trips, with lectures, to the civil courts and to several business firms.

Faculty for the Institute were four of the University's outstanding young scholars: political scientists Victor LeVine and Robert Salisbury, economist Herbert Fraser, and historian Peter Riesenbergh. Director of the Institute was Alex Runciman, director of special projects in liberal education and lecturer in sociology. Secondary school teachers and graduate students served as seminar leaders.

Though the students had been carefully selected—all had been recommended by school principals and counselors—their backgrounds were virtually innocent of any training in political science or economics. Yet the group plunged into readings and discussions of Aristotle, St. Thomas Aquinas, John of Salisbury, Locke, Lord Keynes, A. A. Berle, Jr., Clinton Rossiter, C. H. McIlwain, and R. L. Heilbroner, to name a few. They used techniques learned one day in solving problems or asking questions on the next.

In the opinion of most faculty members, the students had shown by the end of the program a broadening of scope, an intellectual growth, and a surprising ability to formulate concepts of values and ideas, which had been notably hazy at the beginning. By most standards, the University's first American Freedom Summer Institute was extraordinarily successful.

THIS BEING A LIVELY GROUP of teenagers, however, the students found the time and energy for countless projects on top of a tough class and reading schedule. They published their own newspaper, *The Freedom Express*; they put out a yearbook; they sang with the University's summer chorus and performed with the summer orchestra; they spontaneously organized an American Freedom Institute Alumni Club; and they gave impromptu parties, such as the surprise "LeVine is DeVine Fan Club" dinner featuring African cuisine inspired by Dr. LeVine's field of studies.

The rapidity with which the group integrated was remarkable. Most of the students lived in the new Forsyth residence halls, and some who began the Institute as day students soon asked permission to move in too so that they wouldn't miss anything. Living together as a group did, in fact, help to create the community spirit necessary for the success of the program.

The remarkable spirit of the "Instituteniks," as they soon began calling themselves, was apparent in everything from the immediate purchase of University sweat-shirts by the girls (who wore them faithfully through some famous St. Louis summer weather) to the one hundred per cent turnout for the planned activities.

Among these many activities were trips to the St. Louis Municipal Opera in Forest Park, a Cardinals baseball game, and a Fourth of July excursion on the paddle-wheeler Mississippi Belle.

Graduation ceremonies were marked with tearful farewells and fervent promises to keep up new friendships. Many of the students did indeed write their residence hall counselors within a few days, expressing the general sentiment that "The Institute was the most wonderful experience of my life."

Although the personal relations between the students and the Institute staff were important, the real impact was universally felt to be the achievement of the serious purpose of the Institute. Comments by the faculty clearly showed this:

"The response of the participants to the reading material, to the lectures and the lecturers, to the complementary activities, and to the climate of learning and intellectual curiosity that we sought to create for them was little short of overwhelming," said economist Fraser.

"It was immensely rewarding to note the high level of enthusiasm they sustained throughout the five weeks," said Victor LeVine. "Not only did most of the students manage to finish the large amount of reading assigned to them, but they found time to read a good deal of the material placed on reserve in the library, and periodically raided the bookstore, purchasing books on a wide variety of cultural, scientific, and generally intellectual subjects."

Said Nick Adzick, one of the seminar leaders: "The responsibility for this enthusiasm and accomplishment must rest at the door of the complete academic freedom which prevailed at the Institute. No issue or problem was too sacred to touch. This interplay of ideas through free expression is certainly the essence of American freedom."

Chancellor Eliot summed it up: "If we are on the side of freedom, as we are, then surely it is of first importance that we know what we mean by that word . . . Americans embarked on a great and novel adventure when they established a nation committed to the idea of a government of and by the people . . . we are still engaged in this adventure. Our success may depend on our own thorough understanding of what we are trying to do."

Let the students have the last word:

"The Institute not only taught me about the things I know least, but it also created in me a thirst for more knowledge—to probe deeper into the things that make our system work."

"I knew little of the concepts behind our tradition when I came here. I know some now, but I leave with a real desire to learn more—and I think I know how."

"I felt that the staff was one of the great assets. Their frankness of presentation, knowledge of material, and openness to questions (including the trivial and the unanswerable) made a free atmosphere for thought."

"Undoubtedly the best five weeks of my life."



Peter Riesenbergh, associate professor of history, delivers a dynamic lecture on the growth and development of the basic concepts of American freedom through the ages.



Students meet in seminars to discuss the lecture material. Faculty members noted that discussion was lively and that the questions were always pertinent and often penetrating.



Herbert Fraser, assistant professor of economics, and Joe Kelly, one of the graduate student seminar leaders, listen in on a lecture by another faculty member, a practice which led to close integration of subject matter.



Field trips provided students with first-hand experience of the actual working of our American institutions. Here, William H. Webster, lecturer in law and former U.S. Attorney, talks before the group during a tour of the St. Louis civil courts.





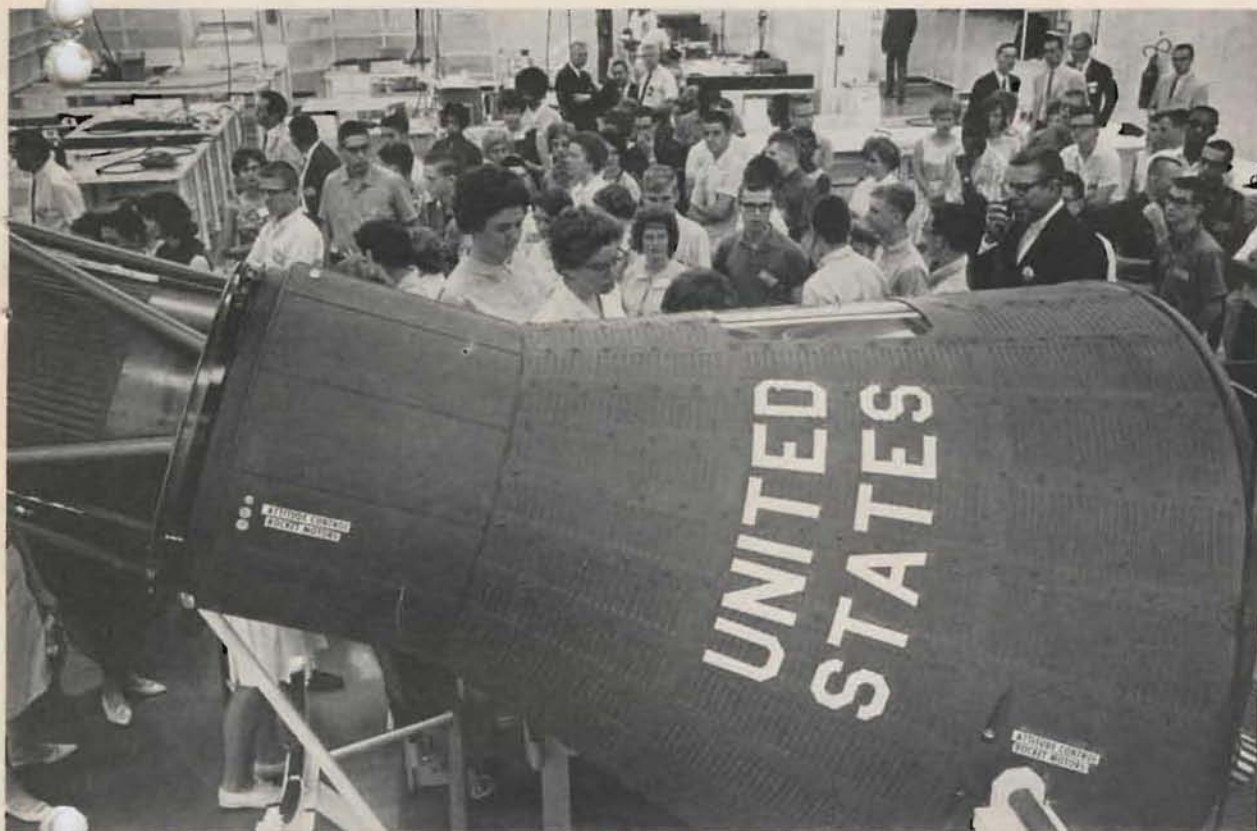
Close relationship developed between faculty and students was one of the most important factors in the Institute's success. Shown with students here is Victor T. LeVine, assistant professor of political science.



John Duvall, liberal arts senior who served as assistant director of the Institute, was one of the favorites of the students. As an expression of their affection, the students kidnapped him and carried him off in a laundry bag to Forest Park, where they held a picnic in his honor.

An excursion on a Mississippi paddlewheeler mixed fun with work. As an exercise in economics, students pretended they were refugees sailing for a new land and worked out all the details of the new society they would establish when they landed.





Students visited many St. Louis business firms during the summer. At the McDonnell Aircraft Corporation, they examined the Mercury space capsule and learned first-hand how a large industrial firm operates.



The students had plenty of opportunity for recreation. This particular group is cheering a spirited softball game between students and faculty.



The majority of students lived on campus in the new residence halls. While his colleagues give unsolicited advice, this student tries his hand at doing his own ironing.



During the summer, the students visited many St. Louis attractions, including a St. Louis Cardinals-San Francisco Giants baseball game. Before game time, they were introduced to Stan "The Man" Musial.



At the end of the five-week program, students, faculty, and University administration attended a graduation dinner, where Dr. Alex Runciman, director of the Institute, presented certificates to the graduates.

By pooling knowledge and skills, a team of Washington University biologists, physicists, biochemists, and medical scientists is making important discoveries about basic life processes

MULTI-SCIENCE RESEARCH

DURING THE PAST DECADE, a unique, multi-science research group at Washington University has been making important discoveries about the behavior of electrons in living things. The work has attracted interest throughout the scientific world and is opening up new and exciting avenues of inquiry on many fronts.

Under the leadership of Dr. Barry Commoner, professor of plant physiology, this unusual scientific team is composed of biologists, medical scientists, biochemists, and physicists. To research problems each of these experts brings his specialized knowledge and techniques and the individual viewpoint of his discipline. By pooling knowledge and skills, the group has achieved results that none of its members could have reached working solely within his own discipline. Washington University is a natural place for such collaborative work, for it has a long tradition of cooperation between scientists in different fields and a close day-to-day working relationship that is truly remarkable in this age of specialization and compartmentalized knowledge.

In 1954 this group produced experimental verification of the theory that "free radicals," reactive molecules which contain unpaired electrons, participate in biological processes. Since then the University has become a center of an intensive program of free radical biological research in which faculty members from several departments on the main campus and at the School of Medicine participate. Out of this research has come a number of new discoveries about the nature of living processes. Practical developments have also resulted; the most recent a method of differentiating between two types of yellow jaundice without exploratory surgery.

The beginnings of this remarkable program can be traced back to one night in 1949 when a group of Washington University faculty members and their wives met for an informal program of chamber music at the faculty apartments on campus.

Among the group that night were Dr. Commoner and Dr. George E. Pake, now the newly appointed provost of the University but then a 25-year-old associate professor

Biologist Barry Commoner, foreground, prepares to measure free radical content of a liver specimen in electron spectrometer designed by Physicist Jack Townsend, shown in the background.



Dr. Jesse Ternberg of the School of Medicine prepares to obtain a liver sample from a jaundice patient for testing free radical content in the electron spin resonance laboratory.

of physics. Pake was there to contribute his talents on the French horn; Mrs. Commoner was the group's cellist. After the music, Pake and Commoner fell into conversation. They soon discovered that each of them had a strong interest in the behavior of electrons—Pake because he was a pioneer in a new field of physics involving the magnetic properties of subatomic particles, and Commoner because of a profound conviction that still unknown physical processes, in which electrons might play an important role, lie behind the apparently well-understood chemical reactions by which energy is released in living matter.

IT HAD LONG BEEN KNOWN that molecules are held together because the electrons associated with the separate atoms pair up and develop a common pattern of motion. The chemical substances that living things use for food are also held together by such pairs of electrons. The enzymes that release energy from such substances must pull electrons away from the molecule, but no one knew *how* this electron movement took place. One theory, proposed in 1930 by the renowned biochemist Leonor Michaelis, was that the electrons were taken away one at a time, instead of in pairs. This meant that halfway through the process there had to be some molecules with unpaired electrons. A molecule with such an unmated electron is called a "free radical." If the theory were correct, free radicals ought to occur naturally in living cells. Moreover, it might help explain the important biological processes which on purely theoretical grounds had been supposed to involve free radicals: the effects of ionizing radiation, ultraviolet and visible light, chemical production of cancer, and aging.

When it was first proposed, the Michaelis theory met with little support, for free radicals were known to occur chiefly as very unstable stages in extremely violent chemical reactions, such as flames and explosions. Michaelis died in 1949, the year that Pake and Commoner met, without having been able to prove his theory experimentally. But to Commoner, the theory had the appeal of a basic, if unorthodox, approach to an unexplored problem. He was delighted to learn, that night in 1949, that the physicists had discovered new things about the magnetic properties of electrons which might provide a method of determining experimentally whether free radicals really do participate in the chemistry of the cell.

Dr. Pake had been Edward Purcell's graduate student at Harvard when Purcell was just beginning the work which was to win him a Nobel prize (with Felix Bloch of Stanford) on a phenomenon called "magnetic res-

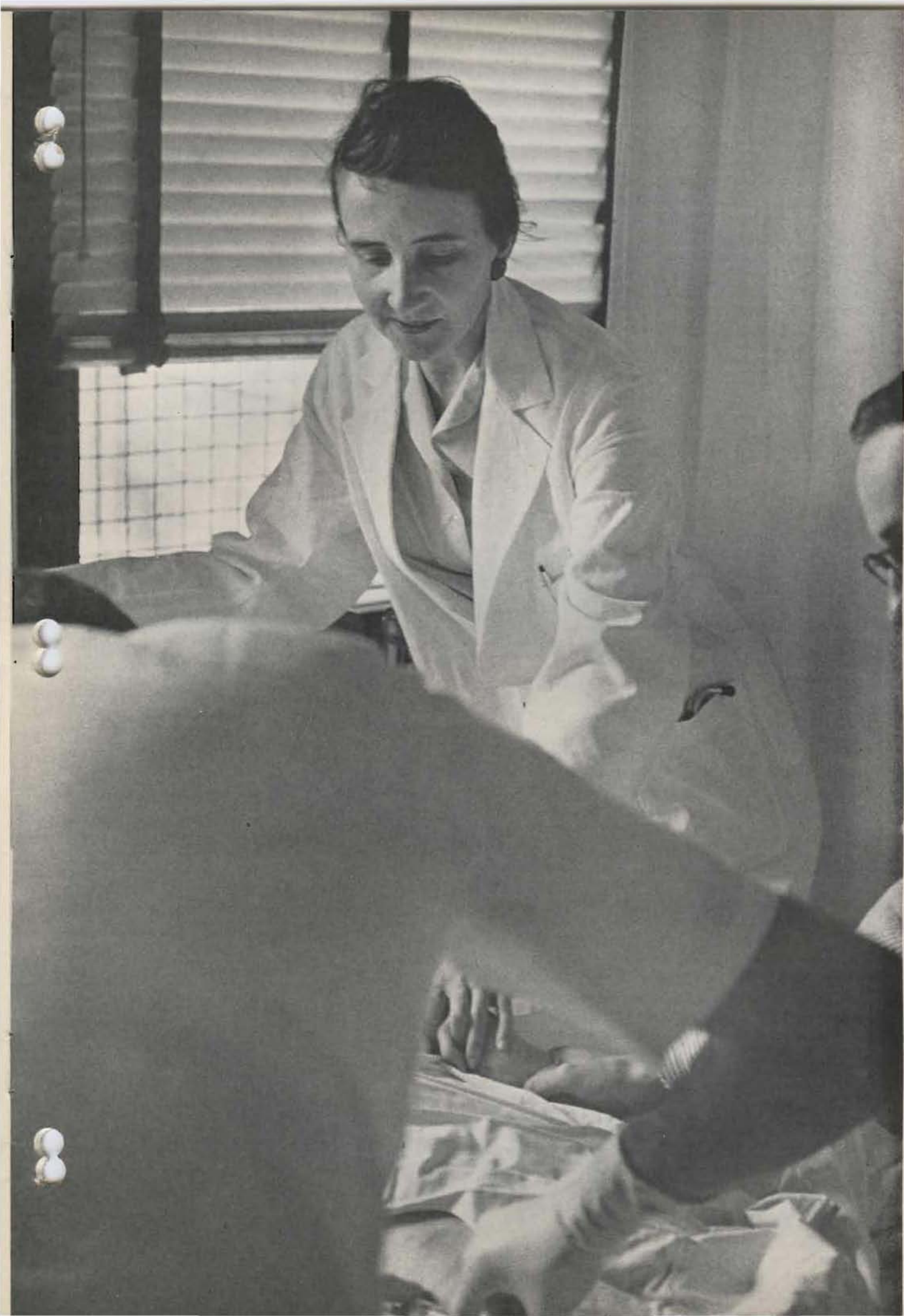
onance," first observed by a Russian, Zavoisky, in 1945. Pake, a pioneer in the field, was still working with it.

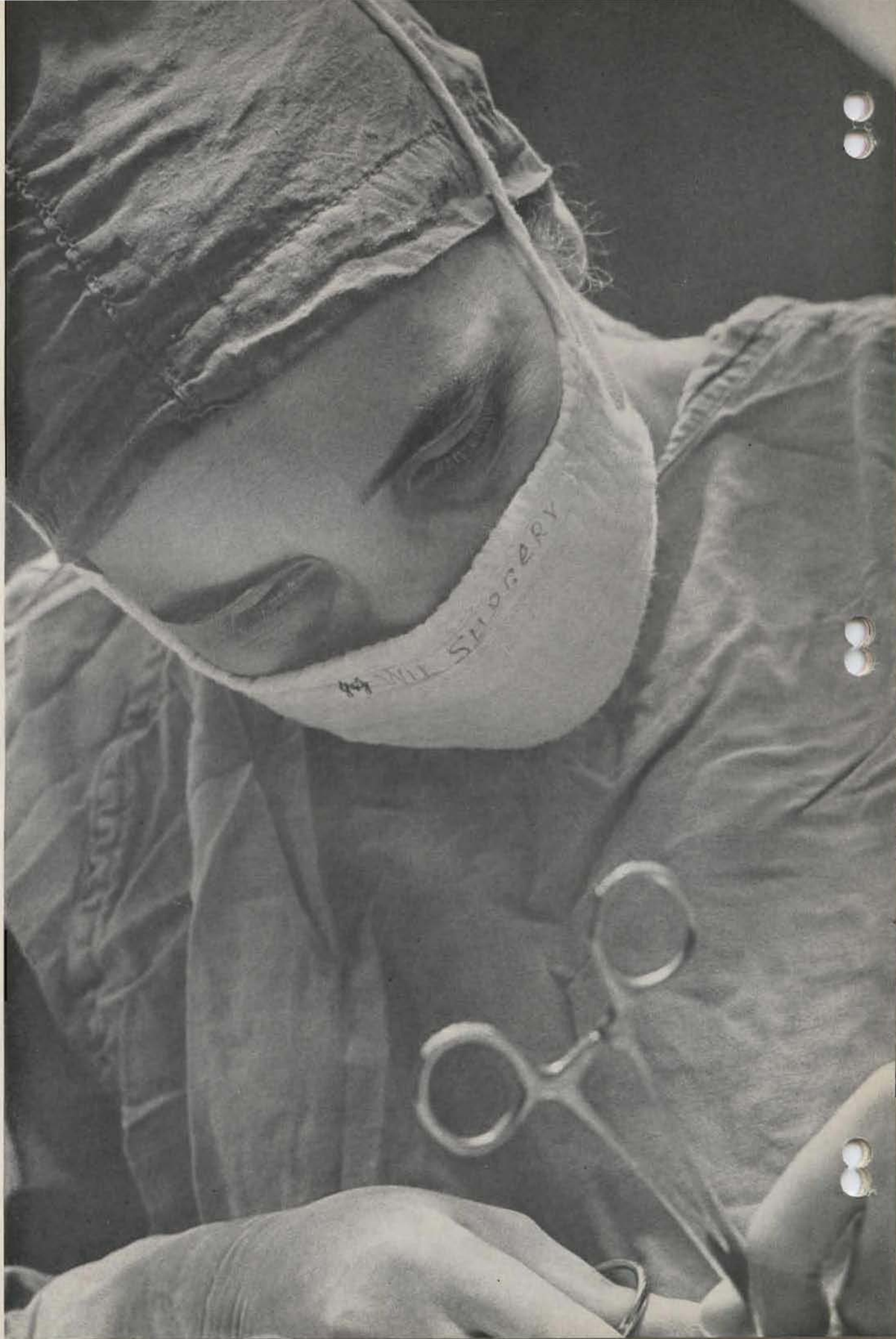
Magnetic resonance is based on the fact that certain subatomic particles, including the electron, seem to spin like tops, and, being charged electrically, generate a magnetic field. (In other words, the electron is a tiny magnet.) In a magnetic field the electron's magnetism interacts, and it will begin, in addition to its spin, to circle slowly, much as a top which has been tilted a little off center will circle around the vertical pull of gravity (or, technically, it will "precess"). Now, if this "precessing" spinning electron is also subjected to another magnetic field at right angles to the main one, but this one pulsating (much like radio or radar), then, when the frequency of the pulse becomes the same as the frequency of the precession, the one boosts the other, changing the electron's orientation, and can flip it over completely. When this change occurs, energy is absorbed; and this absorption can be detected by appropriate instruments and recorded on graph paper.

Such effects do not occur in ordinary molecules for their electrons are paired and the magnetic properties are cancelled out. But if free radicals are present, their unpaired electrons will exhibit the effect—electron spin resonance (or "ESR")—revealed as an absorption of radio energy when a magnetic field of the proper strength is applied to the sample. This effect can be detected by an apparatus called an electron spin spectrometer.

Before the end of their conversation that evening in 1949, Pake and Commoner had decided to see if the new techniques for studying electron magnetism could be used to find out whether free radicals appear in the energy-yielding processes that occur in living cells. During the next year, the two scientists did a few simple experiments using some magnetic resonance equipment that Dr. Pake had built for his own work. The experiments were indirect and inconclusive; but they suggested that free radicals might be detected in living things if looked for directly with an electron spin resonance spectrometer. But, if there really were free radicals in living cells, there would be so few of them that the spectrometer would have to be hundreds of times more sensitive than any yet built.

FORTUNATELY, DR. PAKE discovered that a student just finishing his doctoral work in the Physics Department had an interest in the free radical problem and a brilliant capacity for building experimental apparatus. He was persuaded to stay on at Washington University after gradua-





Working with the University's biologists and physicists, Dr. Ternberg has played a major role in the investigation of the role of free radicals in animal tissue.

tion. He is still here, still building, improving, and teaching about magnetic resonance machines. His name is Dr. Jonathan Townsend, now associate professor of physics.

Together, the three men decided to risk their time, effort, and the financial support offered by the Office of Naval Research on the notion that there really are free radicals in living cells and that it would be possible to build a spectrometer sensitive enough to detect them.

The odds were made worse by the fact that living cells contain a large amount of water, which absorbs energy from the pulsating field and so reduces the instrument's sensitivity. No one had ever built an ESR spectrometer sufficiently sensitive to overcome the effects of water, and to detect the exceedingly small amounts of free radicals that, in theory, might be present in biological materials—if they were there at all. Thinking back on this moment in their work, Dr. Commoner likes to quote one of his favorite passages from *The Anatomy of Science* by one of the greatest modern chemists, G. N. Lewis: "The strength of science lies in its naivete. Science is like life itself; if we could foresee all the obstacles that lie in our path, we would not attack even the first, but would settle down to self-centered contemplation."

IN THIS CASE AT LEAST some of the difficulties of reaching the goal of studying free radicals in really living things were foreseen, but for the time, cheerfully ignored. To provide a more attainable target for their first instrument-building effort, the scientists used the expedient of preparing dried materials from quickly frozen living cells in the hope that free radicals, if they were there, would persist during the drying process. Dr. Townsend set out to build his first ESR spectrometer temporarily relieved of the unprecedented task of designing one that would work in the presence of wet, actually living materials.

In 1950 Dr. Townsend's first spectrometer, part of it mounted on a board, was ready to operate. Tested with chemicals known to contain considerable concentrations of free radicals, it yielded good results. But when dried biological materials were tested, no free radicals could be found.

The scientists realized that there might be two explanations for this disappointing result: The instrument was still insufficiently sensitive; or the theory was wrong, and free radicals are not really part of the chemistry of the cell. The investigators chose to continue. Dr. Commoner brought to the physics laboratory tube after tube of dried

biological materials: bacteria, yeast, animal tissues, leaves. All gave results which he describes as "painfully negative."

Dr. Townsend kept working on the machine. It was not simply a matter of stepping up amplification, but also of filtering out background interference under extreme amplification. After one busy weekend in 1952, he increased the sensitivity of the machine 300-fold. A sample of dried bacteria, tested earlier with negative results, was retested and this time, although barely detectable, there was a wiggle at the right place. Living material—or at least once-living dried bacteria—does contain free radicals.

New results came quickly. Sample after sample of dried biological material was tried in the new machine—and in each case free radicals were detected. In material prepared from particularly active tissues, such as in the brain, liver, or growing seeds, the signals were especially strong.

The first hurdle had been surmounted: There *were* free radicals in biological materials. But with this success, the scientists were faced with a new decision. If dried materials prepared from living cells contained free radicals, a good deal could be learned by using a standard approach of biochemistry—the searching out, isolation and purification of the chemical substances responsible for the free radical signals—for the latter could be studied in the dry form. On the other hand, while it is always useful to understand the properties of the separate chemical substances that are found in living cells, it is also essential to understand *how* they behave in the actually living cell, and even in the whole living organism.

With a machine in hand that might permit many useful biochemical experiments on separated chemical components, the temptation was strong to defer the goal of studying free radicals in really living cells, which would demand the construction of a wholly unprecedented spectrometer for studying wet materials.

The decision that was made has become the hallmark of the Washington University group—they would try to join electron spin resonance spectrometry to biology itself.

A machine had to be built which could tolerate some water. The approach used was to increase the basic sensitivity of the ESR spectrometer in order to be able to use a small sample; if a sample is small enough, its water content will not interfere appreciably. Townsend searched out the sources of interference which tended to swamp the minute electrical signals and tried to eliminate or sidestep them. All this took three years.

MEANWHILE, RESEARCH CONTINUED with the "old" machine. Once free radicals had been found in a few living things (or, rather, in their dried residues), the next logical step to a biologist was to make a systematic survey of the animal and plant kingdoms. Specimens from the greenhouse and animal room in Rebstock Hall moved to Crow Hall and back. One day a preparation made from developing frog eggs was put in the machine and threw the needle off scale—it was by far the richest free radical material yet examined. The scientists became excited; they felt that this might prove that free radicals were deeply involved in embryonic development. In order not to destroy this delicate developmental material, they extracted the various chemicals with infinite care, precaution, and labor. It became a departmental joke when they found that they could easily purify the free radical in frog eggs by cooking them overnight in a very strong solution of acid—which destroyed almost everything in the eggs except the free radical.

The free radical was the black pigment found in frog eggs—melanin—the same coloring agent responsible for brunettes. This was a surprise. How could something as chemically stable as melanin contain the supposedly elusive unpaired electron?

Dr. Samuel I. Weissman of the Department of Chemistry had been doing extensive ESR experimental work on the structure of large organic molecules. He had found that very large molecules make extremely stable free radicals. Also, for good technical reasons, most of them were intensely colored. And that explained melanin, which met both requirements.

Next step: Would other biological substances with large dark molecules give strong free radical signals? They did—even licorice. So did tar. Tar comes from petroleum, so crude oil samples from various parts of the world were obtained from the Department of Geology (now the Department of Earth Sciences) and all showed strong ESR free radical response. So did coal and uranium ores that contain carbonaceous material.

If petroleum contained detectable free radicals, then it occurred to Commoner and Townsend that it should be possible to build an ESR instrument which might detect petroleum at a distance. They discussed the matter and with the encouragement of the Office of Naval Research applied for a patent on a new method of hunting petroleum, coal, and uranium. The patent was issued in October of this year.

Thus, as is so often true in science, basic research had

opened up unexpected and practical bypaths. Yet, these side developments did not detract from the main endeavor—the search for fundamental knowledge.

In 1955 the new machine, which could tolerate water and therefore permit direct free radical measurements of active living preparations, was ready, and Dr. Commoner and his colleagues began a series of far-reaching free radical studies of some of the fundamental processes of life. The electrons involved in free radical electron transfer have proven to be, as the *New York Times* described them in editorializing on this Washington University research, "Bridges of Life."

The methods by which the green chlorophyll of plants "fixes" the energy of light to live and create food is basic not only to plants but to all higher life—since all animal food ultimately comes from plants. In collaboration with Dr. John J. Heise, then a graduate student, Dr. Commoner studied plants that transform the energy of food into light in the new ESR spectrometer. When the plants were illuminated, there was a jump in the graph trace—proving an increase in free radical content.

STILL, THE SIGNALS, THOUGH CLEARLY recognizable, were not sharply defined; the instrument was not yet as sensitive as they wanted it. By pressing harder with the techniques which had previously increased the sensitivity, another jump was made. The resolving power and sensitivity, in this latest instrument, were so improved that, in retesting with photosynthetic samples, not only was the presence of free radicals detected, but different "peaks" were noted on the graph record, even after the illumination was turned off, indicating different stages in the electron—and energy—transfer processes.

The next step then could go deeper. Enzymes are the catalysts which are responsible for the speed and efficiency of energy exchange in living cells. Did they work by electron transfer and the production of free radicals? Experiments by the group, including work by Drs. Janet Passonneau, Sue Lippincott, Thomas C. Hollacher, and Hwai-Li Wang showed that whenever these enzymes were at work, free radicals appeared. After 25 years Michaelis had been proved correct.

The highly sensitized ESR machine allowed much more precise and intricate work. How, *exactly*, did free radicals originate in enzyme reaction? By detailed studies of the amounts of free radical that appeared under different conditions of enzyme activity they showed that the free radical arises when the enzyme combines with the molecule



on which it acts, and a pair of electrons become separated: The enzyme's very action as a catalyst was dependent on its ability to form a free radical. And that drove the nail home.

BUT THE UNION BETWEEN electron spin resonance spectrometry and biology had only begun. The most important subject of biology is man, and we know more about human biology than we do about the life of any other living thing. Clearly medicine was an important testing ground for the new idea that free radicals play an important role in the chemistry of living things. For their part, scientists of human biology—the physicians, surgeons, and medical investigators—are eager to use every advance in the basic sciences to deepen their understanding of the normal and abnormal biology of man.

At the Washington University School of Medicine, Dr. Jessie L. Ternberg, assistant professor of surgery, who holds not only a medical degree, but one in biochemistry as well, was interested in the role of free radicals in animal tissues. Another collaborative team was created, this time tying together the operating rooms and laboratories at the Department of Surgery, the ESR laboratories in the Adolphus Busch Laboratory, and the electronics shops in Crow Hall. For the first time free radicals were observed in living fragments of animal tissues—which contain smaller amounts than are found in plants or bacteria. Here, then, was a vast new field to explore. Dr. Ternberg began to collect small tissue samples, obtained during the course of operations, from various normal and diseased human organs.

New results were not long in coming: a liver sample brought into the ESR laboratory for measurement showed a free radical concentration several times greater than that ordinarily found in human liver. A check of the operating room records showed that the sample had come from a patient suffering jaundice resulting from obstruction of the bile duct. More liver samples were obtained from jaundiced patients and it was discovered that high free radical content occurred only when the disease was due to bile duct obstruction.

With this knowledge, the first possibility of using the ESR techniques for medical diagnosis opened up, for a method of distinguishing between the different forms of jaundice could be of considerable importance in medicine.

Obstructive jaundice, which occurs when the bile duct itself is blocked, has important differences from that form—or forms—caused by a basic disorder such as hepatitis

in the bile-producing cells themselves. The first kind calls for surgery to remove the obstruction; surgery is useless for the second. Yet, because the two are often difficult to distinguish without opening up and taking a look, needless operations are sometimes performed.

The test that Drs. Ternberg and Commoner devised uses minute liver samples obtainable with simple needle biopsies. While high free radical content means that the disease is obstructive jaundice, a low content indicates medical jaundice. This procedure is expected to improve the diagnosis of jaundice and reduce the frequency of unnecessary operations. To exploit this possibility fully, of course, there must be generally available a commercial, practical, and specially designed ESR diagnostic machine. Such a machine is now being planned by a St. Louis electronics industrialist who became interested in the problem when he visited the ESR laboratories on a group tour of the University.

ESR studies on human tissue open up many new possibilities. Tests on cancer tissue have shown lower free radical concentration than normal tissue, even normal tissue from the same organ; and there is other work waiting to be done on the free radical properties of cancerous tissue.

THE STORY OF ESR ANALYSIS of biological free radicals at Washington University is not so much about apparatus as it is about people. What has been accomplished is the direct result of the remarkable spirit of cooperation that has grown up through the years among scientists in different fields. Commenting on this unusual cooperation, Dr. Commoner remarks:

"One of the wonderful things about the community of scientists at Washington University is that we are all welcome in each other's laboratories."

Working alone a biologist would be powerless before the formidable task of building a new ESR spectrometer sensitive enough to detect the less-than-one-part per million concentrations of free radicals in living cells. By himself, the physicist is not likely to build a spectrometer with the precise requirements needed to solve the biological problem. Without the participation of a medical scientist, the work might fail to reflect the intimate knowledge that we have of the biology of man. But, working together these and other scientists can create from their separate skills, ideas, and hopes that living, growing enterprise which is science.

The Psychology Department's laboratory school uses both modern mechanical methods and personal guidance (below) to help retarded children toward self-sufficiency and hope for a useful adult life. The teacher is Clarice Larry of the St. Louis County Special School District.



This Psychology Department program helps prepare retarded children for a useful adult life and provides valuable research into this problem

LABORATORY SCHOOL

THE OLD CHILDHOOD GAME of playing store is proving a valuable teaching tool in the Psychology Department's laboratory school for retarded children. The school's "grocery store" has many improvements over the classic collection of old boxes and egg cartons on which most play stores are based. Each child has a telephone, connected through a central switchboard to the store, so that turns can be taken playing customer, telephone operator, and clerk.

Each day, impressive quantities of bananas, cereal, soup, milk, eggs, and, of course, cookies are duly ordered, written down on lists, and totaled up in dollars and cents. In the process, the children's grasp of reading, spelling, speech, and arithmetic is steadily improved. As for the children, they never seem to tire of the telephones and use them also to converse with astronauts, Martians, and other exotic dwellers in far-away lands.

The telephone system was suggested by Dr. George W. Kreezer, director of the school and professor of psychology at the University. Dr. Kreezer, who is also in charge of a National Institute of Mental Health training program for psychology students doing research in retardation, felt that the telephones would stimulate interest in learning and help hold the children's interest. The phone would also make it possible to take tape recordings of the children's speech patterns as an aid in studying each child's progress and in measuring the effectiveness of the teaching.

The communications system was created and installed by a volunteer group of employees from the Southwestern Bell Telephone Company, using obsolete equipment donated by the firm.

Dr. Kreezer and his wife, who is associate director of the school, are always alert to ways in which instruments and other mechanical devices can facilitate learning. The classrooms are also equipped with instruments developed

in experimental psychology and human engineering, such as the simple analogue computer developed to help the children learn arithmetic, and the movie camera and television system to make pictorial records of the children's activities.

This equipment also helps the school fulfill its other main purpose of exploratory research into new methods of teaching retarded children and of finding better ways to record their activities and speech. Psychology and education students find the school an excellent opportunity to work directly with retarded children and to gain experience with them at the same time that they are attempting to make research contributions to the field.

HOUSED IN THE PSYCHOLOGY Department's quarters in Eads Hall, the school draws pupils from the St. Louis County Special School District, which also provides a teacher. The program began in the summer of 1958 as a day camp operated with the aid of a group of students. The University later donated space in Eads Hall and eventually the program developed into a laboratory for research into retardation.

In addition to instruction in the three R's and special training in speech, the school provides room on the program for art, music, dancing, handicraft, sports, and manual skills.

While the telephones, the computers, and the television system are useful and important teaching aids, the main emphasis is still on the personal contact between teacher and pupil. Workers at the school soon come to know that their students are children like any others, needing love and understanding and wanting the same experiences as other children. The school is proving that a great deal can be done with retarded children if the task is approached with patience and understanding.



One of the children is shown operating the school's telephone switchboard system, which was donated by the Southwestern Bell Telephone Company.



When this student reads aloud, electronic equipment buzzes if sound level gets too high. Some retarded children have trouble keeping their voices at a normal level.



In school's "grocery store," one of the pupils takes down an order from one of the other students over the special telephone system installed to help teach speech, arithmetic, and other fundamental skills to the class.





A graduate student works with a child who is learning arithmetic employing a simple analogue computer developed to permit retarded children to work easy sums without depending on rote memory.



The intellectual in America is incapable of responding to the political world, Professor Salisbury maintains, because ideologies are no longer relevant to American politics



THE POLITICS OF COMPETENCE— AND FRUSTRATION

By ROBERT H. SALISBURY

*Associate Professor
of Political Science*

WHEN JOHN F. KENNEDY received the Democratic Presidential nomination, a good many non-Harvard intellectuals declared they would "sit this one out." Kennedy's record to the contrary notwithstanding, his political style was too calculated and cool, too unemotional and factual to provide the ideological fireworks the intellectual liberals remembered from the past and longed for in the present. Kennedy might seek somewhat different objectives, though even here the difference was not clear, but his approach to the political process seemed essentially indistinguishable from that of Richard Nixon. Despite their massive distaste for Nixon, intellectuals had to be urged with unaccustomed vigor by their committed colleagues to the point of view that there *was* a difference between the candidates.

Once the campaign was fully under way and the old slogans reasserted, the disappointment of American intellectuals over the course of our contemporary politics was muted by such burning issues as: Can a Catholic win? Who stands for what in the Formosa strait? and Whose complexion looks best in television debate? Charm and hoopla roused most of the hand-sitters to at least a modest involvement by election day.

With Kennedy's victory came another distraction for the writers and talkers and (perhaps) thinkers of the nation: Jobs. Seats near the top. It was 1933 all over again.

Men of ideas were in demand. Grammar and syntax were restored in the land. A poet graced the inaugural platform and intellectuals were to roam the corridors of power. The intelligentsia moved swiftly from summer disgust to winter enchantment with politics. Had the critics been corrupted by coming close to power? For a time it did appear that the Kennedy Administration was genuinely committed to the cultivation of ideas and their progenitors. Before six months of the Kennedy term had elapsed, however, the liberal critics were at him again. White House receptions for Nobel Prize winners were no substitutes for bold breakthroughs in policy. The 100 days of 1961 were hardly worthy of comparison with 1933. How was it, the ideologists asked, that an administration so infiltrated by "our boys" could fall so short of "our" standards? For an answer we can begin with the observation that the 1960's hardly resemble the 1930's, politically or in other ways. More than that, the great Harvard shift from Cambridge to Washington masks a substantial change in the nature of our political system that renders so many intellectuals, indeed so many people generally, unable to respond in traditional, meaningful ways to the political world. The political uncertainty of the liberal intellectuals may grow out of the same condition which encourages the growth of John Birch societies and Minutemen—the end of ideology in a consensual society.

One of the recurring themes of the perceptive political sociologists of our time is that in the United States, and probably in England, ideology is dead. By this they mean that the essentially class-oriented rhetoric which dominated so much of Western politics for the past hundred years has largely lost its relevance. Labor and management are as often allied against a rival industry or foreign country as ranged militantly against each other. The union movement, not long ago a touchstone for liberal intellectuals, is declining in relative size about as rapidly as it is losing its ideological appeal. Where are the liberal intellectuals when it comes to the Teamsters? Thus in the West the slogans and ideas which were rooted in this set of social conflicts—notably, Socialism and its various offshoots—have lost much of their connection with the real world.

The battles of the liberal society for suffrage, for economic and social justice, for the socialization of the risks of poverty, disease, and old age have, in principle, been won. A firm consensus underlies the positive use of governmental authority to enlarge the welfare of the disadvantaged, and to control the swings of the business cycle. Even the enforced inequalities based upon race or religion are being steadily eliminated, and the progress, however slow and painful it may seem, is clearly irreversible. The tasks for which liberals once went to the barricades are now largely mopping-up exercises.

Following the successes of the causes to which they were once devoted, intellectuals have generally turned down one of three paths. One is the apolitical road of private concern. This is the direction overwhelmingly taken by the novelists and dramatists, the poets and painters, the literary critics and an enormous proportion of the non-aesthetic academics. Living fairly well in their suburban homes, traveling abroad at the expense of this or that foundation, and, above all, concentrating through all the media of expression on the perennial problem of the self, this very large group of intellectuals has rejected politics almost entirely. Novels and plays do not pretend to have social significance, and proletarian themes are as square to modern painters as a Watteau landscape. The "beats" differ from those whom they despise as conventional only in their linen and their tastes in stimulants. No less and no more do they look upon political affairs as a specialized form of human activity in which they happen to have no interest whatever, and for their detachment they feel no need to apologize.

A second path through the present has been followed by those to whom *concern* is still a personal imperative but for whom the old objects of concern have lately turned to dross. They must be engaged, but to whom and for what? Peace is a possible cause, made more or less corporeal in the form of nuclear testing. Quite a number of those who once walked the picket lines or excoriated the robber barons now try to prevent fallout. They are joined by refugees from the League of Women Voters who have given up on the unicameral legislature, and some of the younger set who are hoping to find a latter-day substitute for the Spanish Civil War.

A third route is to relevance. It is the one least accessible to most people, but the one most in tune with the

nature of our political condition. It is the way of expertise. The scientists and engineers can serve this way; so can the management experts, and, especially, the social scientists. They can bring their specialized knowledge to bear upon a problem—a lack identified in the body politic, which, in our consensus on what we want to achieve, we agree should be remedied. Are our senior citizens getting inadequate medical care? Do our cities need renovating? Is our mass transportation inadequate? Will there be enough schools and teachers? Will the new African countries be able to develop their economic and social potential? These and other similar questions are the kinds of issues which confront both us and our fellow industrial nations. To be sure, each issue is overlaid with a certain amount of ideological gloss left over from past conflicts. In a few cases, notably France, the social cleavages from the past are still strong enough today to dominate the approach to these questions.

But fundamentally these are different types of questions from those which have dominated our politics for the past century. They do not challenge the existing rules of the game. They do not involve the allocation of power or privilege to various social groups. They are essentially questions of fact; of how, in fact, to achieve the goals that are agreed upon. Because the facts are complex, persuasive answers can be given only by those who are experts and specialists. The nuclear testing issue is of this kind, despite the mass support associated with each side of the argument. Only scientists can answer the critical questions of fact on which the decisions depend. Practically all military preparedness matters are in this category. Expertise of the professionals is indispensable. So with foreign affairs generally. And so with an ever-growing proportion of the domestic issues. Experts may disagree, of course, but specialized knowledge is a prerequisite to participation in the debate. Commenting on the appointment of Anthony Celebrezze as Secretary of Health, Education, and Welfare, James Reston observed:

"President Kennedy's Cabinet . . . is a collection, not of striking personalities, but of competent and industrious technicians. . . . This is the modern fashion in the world. . . . Competent technical knowledge now heads the list of priorities."

Here then is the key to the ambivalence of the intellectuals toward the Kennedy Administration. The President (and Mr. Nixon, too, in large measure) projects an image of himself that stresses an unemotional, empirically-oriented competence in dealing with problems. His criteria for the selection of advisers, as well as of a vice-presidential nominee, have followed the pattern of non-ideological expertise. The New Frontier has placed a premium on specialized knowledge, but there has been little comfort for those who need the old slogans to buoy up their political enthusiasm. Even the Peace Corps, drawing on the considerable reserve of secular missionary zeal among young citizens, insists on technical skills as the indispensable accompaniment of eagerness.

For all those with interest but no training, with prejudices but no preparation, this style of politics has little place. What can the dedicated dilettante offer but his

dedication, and for this there is no demand once the election campaign is over.

So ideology is no longer relevant to the central problems of the political system, and intellectuals, the chief purveyors of the old ideologies, find themselves superfluous and disoriented. The traditional conflicts which bred the old slogans have given way to a new consensus, and the *conflicts* in society have been replaced by *problems*. Yet it cannot be said that the individual capacities for commitment have likewise been dissolved. Technical expertise may have come to dominate the machinery of government, but it is not the controlling consideration in every man's life. For many, who knows how many, neither rationality nor alcohol nor the cultivation of one's garden can adequately substitute for involvement.

The old ideologies served to attract the allegiances of all kinds of people to the political ramparts. Liberal intellectuals aside, where are the people to turn who must attach their passions to political objects? Not to labor or business, for these groups no longer seek nor can they afford to have passionate support. Their objectives have become too specific and concrete, their problems too complex to risk having the subtleties of their interests overwhelmed by rhetoric. Not to the office-holding leadership of the political parties, for their problems, too, are complex and intricate, and at least the major political leaders seem to have realized that in an atmosphere charged with ideological appeals the fact-based solution of problems is made virtually impossible. Neither a campaign based upon rational debate nor one characterized by competing personalities is satisfying to one who would be a True Believer.

What ideas can excite people when the slogans of liberals and conservatives alike have lost their bite; when the competing groups whose conflicts were at the root of our political doctrines have begun to reason together about their problems? If we still need doctrines with an emotional kick to them, whence shall they appear? It is in the context of this question that the latest recurrence of extremist doctrine becomes truly serious.

The John Birch societies, the vigilant citizens' committees, or any of the variety of political entrepreneurs, left or right, who are prepared to make use of the untapped emotional needs of politically-oriented citizens may find more receptive soil than ever before in our history. In such groups an explanation of both personal and social anxieties is provided, prepackaged, with devils specified in any quantity required upon whom to discharge the accumulated aggressions of the followers.

The interest in alleged conservatism on college campuses is similarly a search for the magical formulae and mystic heroes that a rational politics stressing technical skills no longer provides. The William Buckleys and the Robert Welch's, by rejecting the present and all its works, can seem to give answers to the half-formed questions that trouble us, and provide defenses against the manifold threats that surround us. The formulae may make no sense under rational scrutiny, but they are no less satisfying emotionally for that. And, unlike the earlier ideologies, the contemporary seers do not rely on their appeal to particular social groups. Buckley is not an apologist for



business. College students and lower-middle-class housewives are equally susceptible to the arguments. The appeals are made to the whole soci-

ety. The domestic devils are the leaders of every major segment of the society, and the foreign devils threaten us all. The focus of these new ideologies of rejection is characteristically on foreign policy, for the threat of the Soviet Union is real enough to make the whole argument seem plausible. The concern with alleged foreign policy betrayal and the dangers of Communism is really fortuitous. If Russia did not exist, some other target could be invented.

Know-Nothingism is certainly not new under the American sun, but it has rarely gained great strength. Even Senator McCarthy, working within the context of substantial Republican party approval, attacked only carefully selected elements of society—intellectuals, foreign policy experts, etc. Neither labor nor business ever felt his lash, and when he assaulted the Army, he was broken. The traditional weakness of political extremism in the United States has surely been due, in part, to the fact that other, more concrete political and economic movements were present to siphon away most of the political energies of the voters. Business expansion, union growth, immigrant assimilation and farmer protest all had in common the factor of attracting the emotional as well as the rational energies of large groups of people. Moreover, each, in turn, was limited by the demanding presence of other competing groups. But if group competition is declining and party politics emphasizes the rationality of a Kennedy, what will prevent the John Birch groups or their counterparts of other persuasions from attracting the enthusiasms of large numbers of people who are anxious but have no traditional loyalties or legitimate heroes to look to and no skills to employ on the New Frontier.

Perhaps the demagogues will not arise with nerve and skill and luck enough to mobilize a serious force. The magic of leadership is not equally given to all would-be entrepreneurs, and those who might be successful may choose to stay within the consensus rather than work with the explosive potential that lies beneath it. Perhaps the formulae of rejection will not be stated with enough eloquence to stir the depths of emotion they must reach to rouse the populace. In a society marked by agreement on the traditional questions neither devils nor dialogue is easy to assert persuasively.

Perhaps a society in which the emotional security of the citizens matches their economic security, a society where rationality truly prevails, would eliminate the currency of "devils and magic" politics. Yet, who would claim that American society is so rational and its people so responsible that the danger is as fantastic as the slogans of the dangerous.

Nazism grew strong in a context of the social disorganization and conflict of Weimar Germany. The paradox of our contemporary rational mode of politics is that movements similar to Nazism may flourish in the interstices of consensus on the questions of economic and social justice.

BOY



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GIRL

By RAY A. CRADDICK, PhD 60

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Dr. Ray A. Craddick, PhD 60, is a clinical psychologist in the University Guidance Center at New Mexico State University. This article is a summary of the paper he read before the American Psychological Association meeting in St. Louis this summer. A more detailed study of the subject has been submitted for publication to the journal Perceptual Motor Skills.

THE EFFECTS OF HALLOWEEN UPON THE DRAWINGS OF A WITCH BY GRADE SIX CHILDREN

A RECENT STUDY OF Santa Claus drawings by children which suggested that with the approach of Christmas the size of drawings became increasingly larger prompted a similar study involving drawings of a Halloween witch as October 31 approached. Since Santa generally denotes a genial, giving, positive sort of person whose familiarity is greatest on Christmas, the question arose as to the effect of a more ambivalently perceived figure (the trick or treat idea of Halloween, or the time of goblins and witches concurrent with treats from neighbors and friends) on drawings of children.

Grade six students (38 boys and 38 girls) from a local public school were asked to draw a Halloween witch two weeks before Halloween, during that holiday, and two weeks after. Heights of the drawings were measured, and statistical analyses computed to ascertain differences between sizes of the drawings. The results suggested small but statistically significant differences between the size of drawings performed at each of the three times. Differences due to sex occurred, with girls drawing larger figures than boys. The witch drawn on Halloween was the smallest of the three drawings, and the witch drawn two weeks after Halloween was the largest.

Some possible speculations suggested by the study are

that the time factor in itself is important in controlling the behavior of children. The tongue-in-cheek humor attributed to the Halloween witch may have some very real meaning to the child. Subjective aspects of the drawings reflect the awesomeness of Halloween in an embellishment of the drawings on that date, with a return to a more humanized figure after that time.

One may pose the question as to the child's actual perception of the Halloween witch and his handling of this perception. The bravado suggested by the increased size of drawings after Halloween may mean that once the threat is past, children can talk big. At the time of Halloween, the only thing left to the child is behavior which belittles the witch, perhaps in the same manner as assuming witch-like characteristics with Halloween masks and costumes to frighten others. In psychology, such behavior is often seen as a projection of one's own fears onto others. Behavior of a child who, when removed from a fearful situation, talks bravely of his handling of the situation, may be indicated by the results of this study.

In any event, parents may test the validity of the study by observing the behavior of their own children before, during, and after Halloween.

Comment / Dawn of a New Era

ON THE DAY after his inauguration, Chancellor Eliot went to the Homecoming football game. As soon as he and Mrs. Eliot entered Francis Field, the cheers and applause began. As they made their way to their seats, the cheers continued until the entire crowd of 8,000 was on its feet in a thundering ovation.

In a way, that moment in Francis Field symbolized the excitement and enthusiasm Chancellor Eliot's inauguration has brought to the campus. That stirring ovation was a rousing vote of confidence in the new administration and an expression of hope and optimism about the future of the University.

That same feeling of excitement and enthusiasm marked the entire Inauguration-Homecoming weekend. Inauguration Day dawned bright and sunny (perhaps a little *too* bright and sunny for some), the program went smoothly, the storm that broke in the afternoon thoughtfully waited late enough in the day to cause no inconvenience. All in all, it was a most auspicious beginning for the new era.

When the Procession, splendid in its academic garb, marched into the quadrangle for the Convocation, it marked the successful culmination of months of careful planning and hard work. A thousand details had been worked out in preparation for that moment and, incredibly, none had been overlooked. The Inauguration Committee, headed by William M. Akin of the University's board of directors, did a tremendous job. There were a few last-minute crises, but they were all resolved in time.

Chancellor Eliot himself took an active interest in all the preparations, as he has in every detail of the University's operations since his appointment. At one point, Mr. Eliot expressed doubt about the wisdom of the choice of the music of William Byrd for the Processional. Leigh Gerding, chairman of the Music Department, hurriedly found a record of Byrd's music, called the Chancellor and played a few bars over the telephone for him. Mr. Eliot decided that William Byrd's music was just fine.

The new administration has been greeted with enthusiasm by the faculty, the alumni, and the community. Even more important, perhaps, is the warm reception it has received from the students. The ovation at the Homecoming game was triggered by the students and they repeated the performance when the Eliots arrived at the Homecoming-Inaugural Ball.

Although the excitement remains, the pomp and circumstance is over. The celebration has come to an end and the time has arrived to put all this newly generated enthusiasm to work.

In his inaugural address, Chancellor Eliot spelled out clearly and exactly the goals he has set for the University in the years ahead. These specific, major objectives can be summarized briefly. They are:

1. To give all undergraduates a liberal education.
2. To find ways of accelerating the undergraduate's entry into specialized study, in spite of the traditional boundaries separating one school from another.
3. To put increased emphasis on area studies, again without regard to imaginary boundaries between traditional fields.
4. To find ways to increase the quality of the University's service to the community of which it is a part.
5. To concentrate on the preparation of skilled college teachers to meet the ever-increasing demand.
6. To encourage the development of an atmosphere in which teachers and students together discover "the excitement and joy of cultural growth and intellectual adventure."

These are important, realistic, and exciting goals. Merely stating them, however, will not automatically enable us to reach them. It will require the utmost skill and dedication upon the part of the faculty, the students, and the staff, and it will need the wholehearted cooperation of the alumni and of the community. In Chancellor Eliot's words, "This will not be a simple task. It will demand of us ingenuity, imagination, and innovation."

THE IMPORTANT DISCOVERIES being made by a University team of physicists, biologists, biochemists, and medical scientists described in the article "Multi-Science Research" in this issue is an excellent illustration of the kind of flexible, wide-ranging, scholarly activity Chancellor Eliot was talking about when he called for a lowering of needless barriers.

The multi-science attack on the problem of the role of electrons in living things is just one of the areas in which cooperation among the different schools and among scholars in different fields is producing solid, and often spectacular, results. The Graduate Institute of Education, for instance, brings together not only education specialists, but historians, psychologists, and sociologists—many of them holding joint appointments in two fields. The Planning Council for Biology is another illustration, and the recent revision of the School of Engineering curriculum reflects this new approach to learning.

Many more ivy-covered walls will come down if the University is to meet the challenge of the future: the barriers between departments, the division between "professional" and "liberal arts" students, the Snow-fence between science and the humanities. Robert Frost was not talking about universities, but he might have been when he wrote:

"Something there is that doesn't love a wall."

—FO'B



Students from the University's American Freedom Summer Institute sail down the river from St. Louis on the paddlewheeler *Mississippi Belle*.

